REMARKS

Claims 2-3, 5, 11-12, 14 and 18 are pending. By this Amendment, Claims 2-3, 5, 11-12 and 14 are amended. Claims 1, 4, 6-10, 13 and 15-17 are cancelled, and claim 18 is added. No new matter has been added. Reconsideration is requested. Applicant respectfully submits that all pending claims are in condition for allowance.

I. OBJECTION TO THE TITLE AND DRAWINGS

The Office Action objects to the Title and Figs. 6-7. Applicant respectfully traverses these objections.

The Title has been amended.

Figs. 6-7 have been amended in accordance with the Examiner's suggestion to include the label "PRIOR ART"

Withdraw of these objections is specifically requested.

II. THE CLAIMS SATISFY THE REQUIREMENT OF 35 U.S.C. §112, SECOND PARAGRAPH

The Office Action rejects claims 1-17 under 35 U.S.C. §112, second paragraph. Claims 1, 4, 6-10, 13 and 15-17 have been cancelled. Thus, this rejection as to those claims is moot. Claims 2-3, 5, 11-12 and 14 have been amended in conformity with 35 U.S.C. §112, second paragraph. Withdraw of this rejection is respectfully requested.

III. THE CLAIMS DEFINE PATENTABLE SUBJECT MATTER

A. The Office Action rejects claims 1-2, 6, 9-11 and 15 under 35 U.S.C. §102(b) over U.S. Patent No. 5,076,695 to Ichihara et al. ("Ichihara"). This rejection is moot as to claims 1, 6, 9-10 and 15 which have been canceled. This rejection is respectfully traversed as to claims 2 and 11.

Ichihara fails to teach or suggest all the features recited in independent claim 2. In particular, Ichihara does not teach or suggest a range of a numerical aperture of the collective optical system being $NA \leq \lambda/\phi$ PH, as recited in claim 2. To the contrary, Ichihara teaches a

range for a pinhole diameter satisfying the following relationship: $\lambda / 2 \leq D \leq \lambda r / 2a$. These two ranges are absolutely different from each other and one of ordinary skill in the art would not have substituted one for the other.

As to claim 11, the Office Action states that the point diffraction interferometer of Ichihara is used to manufacture multiplayer film mirrors for exposure systems. See the Office Action at, e.g., page 3, paragraph 5. Applicant respectfully disagrees with this statement since, as mentioned above, Ichihara fails to teach or suggest each and every feature recited in independent claim 2, from which claim 11 depends.

For at least the reasons discussed above, Applicant respectfully submits that Ichihara fails to anticipate the subject matter of claim 2, and claim 11 which depends therefrom. Withdraw of the rejection under 35 U.S.C. §102(b) is therefore respectfully solicited.

B. The Office Action rejects claims 3, 7-8, 12 and 16-17 under 35 U.S.C. §102(b) over U.S. Patent No. 5,548,403 to Sommargren et al. ("Sommargren"). This rejection is moot as to claims 7-8 and 16-17 which have been canceled. This rejection is respectfully traversed as to claims 3 and 12.

Sommargren fails to teach or suggest a point diffraction interferometer which measures a surface profile of a surface to be measured by, irradiating a light from a light source to a pinhole mirror via a collective optical system, wherein the light irradiated onto the pinhole is an elliptically polarized light, as recited in independent claim 3.

Another aspect of the Applicant's invention is that linearly polarization is converted into an elliptically polarized light (or a circularly polarized light) by a λ /4 plate, and the elliptically polarized light is irradiated onto the pinhole mirror. See, e.g., Fig. 2. The circularly polarized light has a higher precision than that of the linearly polarized light. See, e.g., page 12, line 18 to page 13, line 6, and Fig. 8.

To the contrary, Sommargren discloses that two beams pass through a polarizer 32 (axis at 45°) to give them the same polarization and are brought into focus, with a microscope objective 34, on the interferometer plate 36. See, e.g., col. 2, lines 52-55 and Fig. 1. Sommargren is silent about converting any linearly polarized light into an elliptically polarized light (or a circularly polarized light). Sommargren also fails to teach or suggest irradiating an elliptically polarized light onto the pinhole mirror, as recited in claim 3.

For at least the reasons discussed above, Applicant respectfully submits that Sommargren fails to anticipate the subject matter of claim 3, and claim 12 which depends therefrom. Withdraw of the rejection under 35 U.S.C. §102(b) is therefore respectfully solicited.

C. The Office Action rejects claims 4-5 and 13-14 under 35 U.S.C. §103(a) over Ichihara in view of Sommargren. This rejection is moot as to claims 4 and 13 which have been canceled, and is respectfully traversed as to claims 5 and 14.

Neither Ichihara nor Sommargren, alone or in combination, teach or suggest all the features recited in independent claim 5. Specifically, none of the applied references teach or suggest that the pinhole diameter is 0.5 μm or larger, and/or satisfying the following conditions:

$$0.5 \leq \gamma < 1, \text{ and}$$

$$\phi = \Delta + 360^{\circ} \times N .$$

To the contrary, Sommargren teaches that an interferometer plate 36 includes a glass substrate, a metallic film 40 and a metallic film 44. Sommargren fails to teach or suggest an internal reflectivity (γ) of said pinhole represented as a reflection by the first reflection coating / an external reflectivity of said pinhole represented as a reflection by the second reflection coating; and a phase difference (ϕ) between the internal reflectivity and the external reflectivity of said pinhole.

Accordingly, the Office Action has not established a *prima facie* case of obviousness, as the applied references fail to teach or suggest all the subject matter of claim 5, and claim 14 which depends therefrom. Withdraw of the rejection under 35 U.S.C. §103(a) is therefore respectfully solicited.

IV. NEW CLAIM

Claim 18 has been added and is also patentable for the reasons described above with respect to independent claim 3, from which it depends.

V. CONCLUSION

In view of the foregoing, Applicant respectfully submits that the application is in condition for allowance. Favorable reconsideration and prompt allowance of claims are earnestly solicited.

Should the Examiner believe that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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MAC:RZE/cfr

Attachment:
Replacement Sheet

Date: May 12, 2003

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